Key factors influencing the e-government adoption: a systematic literature review

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Abstract

Purpose – This study aimed to identify and analyse the key factors influencing the adoption of e-government services and to discern their implications for various stakeholders, from policymakers to platform developers.
Design/methodology/approach – Through a comprehensive review of existing literature and detailed analysis of multiple studies, this research organised the influential factors based on their effect: highest, direct and indirect. The study also integrated findings to present a consolidated view of e-government adoption drivers.
Findings – The research found that users' behaviour, attitude, optimism bias and subjective norms significantly shape their approach to e-government platforms. Trust in e-Government (TEG) emerged as a critical determinant, with security perceptions being of paramount importance. Additionally, non-technical factors, such as cultural, religious and social influences, play a substantial role in e-government adoption decisions. The study also highlighted the importance of performance expectancy, effect expectancy and other determinants influencing e-government adoption.
Originality/value – While numerous studies have explored e-government adoption, this research offers a novel classification based on the relative effects of each determinant. Integrating findings from diverse studies and emphasising non-technical factors introduce an interdisciplinary approach, bridging the gap between information technology and fields like sociology, anthropology and behavioural sciences. This integrative lens provides a fresh perspective on the topic, encouraging more holistic strategies for enhancing e-government adoption globally.

Keywords E-government, Factor, Trust, Adoption, Intention to use
Paper type Literature review

1. Introduction

In the contemporary digital epoch, the metamorphosis of traditional governmental operations into e-government platforms has ushered in a new paradigm of public administration. As nations globally recognise the transformative power of information and communication technology (ICT), there is a burgeoning inclination towards harnessing this digital potential to amplify transparency, enhance efficiency, and democratise accessibility to governmental services. Yet, the landscape of e-government adoption has its complexities. Even as e-government promises myriad benefits, its embrace by the citizenry remains fraught with apprehensions, particularly concerning the sanctity of their private information. This concern resonates in the developing world (Carlo *et al.*, 2012).

This research embarks on a rigorous exploration to answer: "What are the key factors influencing the adoption of e-government services? Furthermore, what implications do these factors carry?" By deconstructing the intricate tapestry of e-government adoption, this study aims to contribute to the extant body of knowledge, providing both theoretical insights and

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pragmatic directions for policymakers. To structure this research, the paper is organised as follows: First, we delve into understanding the nexus between trust and the intention underpinning the usage of e-government platforms. Subsequently, we traverse the landscape of factors that either bolster or undermine this trust. A detailed exposition of the systematic review methodology employed complements this. Then, we shed light on the critical dimensions of e-government adoption, probing its antecedents. We further enrich this exploration by analysing the theoretical models that have previously undergirded research in this domain. Drawing from the synthesis of our findings, we present the results, leading to the unveiling of a proposed conceptual framework. Concluding the discourse, the paper delineates the research implications, offering a reflective recapitulation and a beacon for future scholarly pursuits.

2. Background

2.1 Definition of E-government

Electronic government is known as e-government, which is defined as the government's effort to develop electronic-based government systems. The e-government is also defined as a structuring management system and work processes in the government to maximise the utilisation of information and communication technology to deliver the citizens' public services (Antoni *et al.*, 2019). Over the past several years, government operations have shifted from paper-intensive and face-to-face meetings to a heavier reliance on computer networks and connectivity. The gravitation toward e-government systems can make government entities more transparent, efficient, and accessible to their citizens (Apleni and Smuts, 2020). Other benefits include lower administrative costs, quicker service, less corruption, and greater engagement (Ramirez-Madrid *et al.*, 2022). There are also significant drawbacks. Not all citizens are technologically savvy, and some do not have access to a computer, smartphone, or connectivity to the Internet (Samsor, 2020). Cybersecurity threats and moderate resistance to a change in operations represent other significant challenges to the broader acceptance of e-government (Samsor, 2020). Nonetheless, modernisation of government access and services is essential to meet the changing needs of all citizens.

2.2 Definition of trust in E-government

Trust has long been a fundamental component in the relationship between citizens and their governing bodies (Tolbert and Mossberger, 2006). When examining the context of e-government, trust becomes an even more intricate factor, playing a pivotal role in influencing users' acceptance, adoption, and continued usage of online government services (Twizeyimana and Andersson, 2019). As governments worldwide began to shift many of their services online, aiming to provide more efficient, transparent, and accessible services, the issue of trust in these electronic platforms and processes emerged as a crucial challenge.

Several factors contribute to trust or the lack thereof in the realm of e-government:

(1) Data Privacy and Security: As citizens engage with e-government portals, they often provide sensitive personal information. The perceived risk associated with potential data breaches or misuse of this information is a significant determinant of trust (Muhammad and Hromada, 2023).

(2) Usability and Reliability: The ease of use and consistent uptime of e-government platforms can significantly impact users' trust (Cho *et al.*, 2019). Users might also question the government's capability in other areas if a platform frequently crashes or is challenging to navigate.

(3) Transparency: E-government initiatives often aim to promote transparency in governmental operations. When platforms provide transparent information about processes, decision-making criteria, and the use of citizens' data, trust is bolstered (Carlo Bertot *et al.*, 2012).

(4) Previous Experiences: Past interactions, whether positive or negative, with e-government services can shape users' trust in future engagements. A history of positive experiences can create a sense of reliability, while negative experiences might breed scepticism (Tolbert and Mossberger, 2006).

(5) Digital Divide: Trust also intersects with the digital divide. Those who are not familiar with or do not have access to digital tools might inherently distrust e-services simply because they are not accustomed to them (Samsor, 2020).

Trust in e-government is not just a matter of technology but also ties into broader societal and political contexts. In regions with general distrust in the government or its institutions, this mistrust can extend to e-government services, regardless of the technological safeguards (Tolbert and Mossberger, 2006). Additionally, building and maintaining trust in e-government is crucial for several reasons:

(1) Higher Adoption Rates: Trust encourages more citizens to use e-government services, thus reaping the efficiency and accessibility benefits (Alkraiji, 2020).

(2) Enhanced Citizen Engagement: Trust can increase citizen participation in digital democratic processes, from online voting to e-petitions (Naranjo-Zolotov *et al.*, 2019).

(3) Operational Efficiency: Trust can reduce the reliance on traditional, often slower, methods of service provision, leading to cost and time savings (Ramirez-Madrid *et al.*, 2022).

As e-government initiatives continue to expand, understanding and fostering trust becomes paramount. It is a multifaceted issue that demands a combination of technological, informational, and societal strategies to ensure that the potential of e-government is realised fully and sustainably (Alharbi *et al.*, 2021).

2.3 Previous efforts to analyse E-government adoption

While the concept of trust stands prominently in discussions related to e-government, it is essential to take cognisance of a broader landscape of research addressing the multifaceted factors influencing e-government adoption. Over the years, a substantial body of literature has emerged that seeks to understand the intricate determinants guiding individuals' inclination towards or aversion to e-government services.

For instance, studies have explored the role of technological infrastructure and service quality as determinants of adoption. A solid and stable technological foundation has been identified as pivotal for user adoption, especially in regions grappling with technical challenges (Khan *et al.*, 2021). Service quality, especially regarding response time, ease of navigation, and information accuracy, has also been spotlighted as a significant determinant (Manoharan *et al.*, 2020). Cultural and societal norms also come into play. Societal perspectives about technology and cultural attitudes towards governance can heavily influence how citizens perceive and engage with e-government platforms (López-Nicolás and Soto-Acosta, 2010).

Moreover, past research endeavours have also explored understanding e-government adoption through specific theoretical frameworks. The Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) have frequently

been employed to investigate perceived usefulness, perceived ease of use, and behavioural intention in e-government (Venkatesh *et al.*, 2003; Elenezi *et al.*, 2017).

This present review builds upon these foundations. While many studies, as noted, have undertaken the task of understanding e-government adoption, our effort differs in its holistic approach. We aim to collate and analyse these diverse determinants and weave them into a cohesive narrative, providing a comprehensive understanding of the e-government adoption landscape. Integrating findings from various studies and emphasising non-technical factors introduce an interdisciplinary approach, bridging the gap between information technology and fields like sociology, anthropology, and behavioural sciences. This integrative lens provides a fresh perspective on the topic, encouraging more holistic strategies for enhancing e-government adoption globally.

3. Methodology

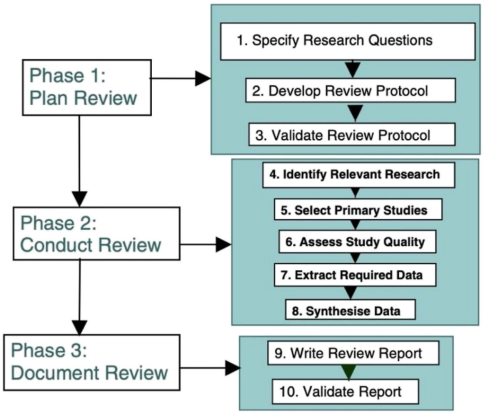
To understand the factors affecting the adoption of security in e-government, this systematic review was conducted based on a three-phase literature review methodology proposed by Brereton *et al.* (2007). The three main phases are planning, executing, and reporting the review. These phases are conducted through a 10-stage review process, as presented in Figure 1.

Specify research question: The first stage of planning an efficacious review was to specify the following research questions: "*What are the key factors influencing the adoption of e-government services?* Moreover*, what are their implications?"*

Develop review protocol: To develop the review protocol, a set of keywords was chosen concerning the key factors influencing security adoption in e-government. The Keywords used for the systemic literature search included a combination of the following terms:

> E-government, factor, cybersecurity, trust, electronic-government, privacy, adoption, intention to use, user, citizen, awareness, compliance and digital government.

Validate review protocol: The published studies were collected from electronic databases, including Web of Science, ProQuest, IEEE, Springer, Emerald, ResearchGate, SCOPUS, Science Direct, and Google Scholar, to validate the review protocols.



Source(s): Created by Brereton *et al.* (2007)

Figure 1.
Systematic literature review flowchart

Identify Relevant Research: To conduct the review, thirty-seven papers were collected that were relevant to the topic of the evaluation by reviewing their title and abstracts. The papers were examined to meet the following criteria: articles published in English between 2010 and 2023 and discussions of the factors that mainly influenced the adoption of the e-government.

Select Primary Studies: Only twenty-five papers have been selected as the primary list of studies. Twelve papers were rejected due to the limited discussion of factors influencing citizens' intention to use e-government.

Assess Study Quality: To assess the quality of the review, each paper was read carefully to specify the control variables of the study and their impacts on the adoption or intention to use the e-government. The control variables were grouped and categorised into independent and dependent variables. The dependent variables were trust, satisfaction, intention to use, and use behaviour/attitude of the e-government adoption. The independent variables were categorised into four groups, including technological, organisational, environmental, and individual context factors (Albar and Hoque, 2017). Technological context includes aspects related to relative advantage, compatibility, and complexity. The organisational context group includes factors related to top management support, employees' ICT skills and organisational culture. The environmental context group includes factors associated with the regulatory environment, the competitive environment, supplier pressure and customers. Individual context groups include factors related to owner/manager innovativeness and owner/manager ICT skills and knowledge.

Extract Required Data: A table was created to record the required extract data from the primary study papers. The recorded data were the title, author, the published year, the aim of the study, the journal published in, the countries examined, the research methodology, factors influencing the adoption of e-government, e-government adoption measurements, and the findings.

Synthesise Data: Once the data was extracted, it was synthesised to answer the research question. First, some qualitative data were aggregated based on simple tabular formats to summarise the factors influencing the adoption and intention to use e-government. Next, the data was cleaned to reach a conclusion contributing to understanding factors with high impacts on e-government adoption and intention to use.

Write and Validate Review Report: The systematic review has been completed at this stage. And the review question has been answered. Next, the conducted work must be documented as a review paper to summarise the research comprehensively. Then, it must be validated to be submitted to an academic journal, allowing other researchers and professionals to quickly access and understand the existing evidence on the topic (Brereton *et al.*, 2007).

4. Data analysis

The process of the three-phase literature review methodology proposed by Brereton *et al.* (2007) has resulted in a primary list of 25 studies that will form the basis of this systematic review report.

4.1 The E-government adoption

The results included critical aspects of e-government adoption, primarily on individuals' trust towards e-government platforms and their subsequent intention to use these services. Trust in e-government evaluates how much faith users have in the security, credibility, and efficacy of e-government services (Chatterjee and Kar, 2017; Ejdys *et al.*, 2019; Mustaf *et al.*, 2020). Trust is fundamental in digital platforms, especially when sensitive data is involved.

A higher level of trust is typically associated with a greater likelihood of service adoption (Alzahrani *et al.*, 2016; Alkraiji, 2020; Kanaan *et al.*, 2023; Qishun, 2023). Intention to use e-government assesses the likelihood of users engaging with e-government services in the future (Chatterjee and Kar, 2017; Cho *et al.*, 2019). The intention to use is often driven by prior experiences, perceived benefits, ease of use, and users' trust in the platform (Shahzad *et al.*, 2020; Iqbal and Genie, 2022).

4.2 Antecedents of the E-government adoption

Technological context garnered a total of 69 factors, out of which 29 were direct and 40 were indirect (Table 1). The dominant factor in this context is perceived security, emphasising the significance of securing online transactions and maintaining data confidentiality in e-government platforms (Table 2).

Organisational context produced 18 factors, with eight direct and ten indirect (Table 1). Credibility, reliability, and organisational commitment were found to play pivotal roles (Albar and Hoque, 2017; Samsor, 2020; Qishun, 2023) (Table 3). The findings suggest that e-government platforms should not only provide reliable services but should also foster an organisational culture that actively promotes the adoption of these services.

Environmental context has 11 factors, split between 4 direct and seven indirect factors (Table 1). The perceived quality of life, indicating the positive impact of e-government

Table 1. Factors found by context

Factors	Direct Factors (n)	Indirect factors (n)	Total (n)
Technological context	29	40	69
Organisational context	8	10	18
Environmental context	4	7	11
Individual context	54	14	68

Source(s): The author's own creation/work

Table 2. Technological context factors

Technological context factors					
Perceived security	Perceived privacy	Perceived compatibility	Overall perceived risk	Privacy risk	Security risk
Personal information risk	Time risk/ perceived response time	Perceived value	Perceived ease of use	Perceived information quality	Perceived system quality
Perceived service quality	Perceived usefulness	Convenience/ personalization	Accuracy/ completeness	Website design	

Source(s): Created by Albar and Hoque, 2017

Table 3. Organisational context factors

Organisational context factors					
Interactivity, and responsiveness	Facilitating conditions	Availability of resources/ accessibility	Credibility and reliability	Organisational commitment/ encouragement/ incentive	Perceived transparency

Source(s): Created by Albar and Hoque, 2017

services on citizens' lives, stood out (Chatterjee and Kar, 2017) (Table 4). This suggests that the higher the adoption rate, the more e-government services can improve the quality of life.

Individual context dominates with 68 factors, with 54 direct and 14 indirect factors (Table 1). Notably, use behaviour, attitudes, trust in e-government, and awareness were identified as the main drivers (Tolbert and Mossberger, 2006; Iqbal *et al.*, 2020; Iqbal and Genie, 2022) (Table 5). It suggests that user attitudes and trust are paramount in adopting e-government services.

4.3 Research theoretical models

Several theoretical models were identified based on the number of papers utilising them. The most prominent model was the Unified Theory of Acceptance and Use of Technology (UTAUT), which is featured in 13 papers. This model seeks to understand the factors influencing individuals to accept and use new technology (Al-Sammarraie and Al-Swidi, 2019; Sabani, 2020; Mensah and Mwakapesa, 2022). Following UTAUT, the Technology Acceptance Model (TAM) was mentioned in 15 papers. TAM is a renowned model that investigates the determinants of user acceptance of information systems (Cho *et al.*, 2019; Iqbal and Genie, 2022). The Diffusion of Innovation (DOI) and the Theory of Planned Behaviour (TPB) were discussed in three papers. While DOI examines how innovations spread within a population, TPB is centred on understanding the intention behind a particular behaviour (Al-Sammarraie and Al-Swidi, 2019). The remaining models, including Social Cognitive Theory (SCT), the Model of Personal Computer Utilisation (MPCU), Self-determination Theory (SDT), Uncertainty Reduction Theory (URT), Information Systems [IS] Continuance Model, Quality-value-loyalty Chain Model, Theory of Reasoned Action (TRA), and Unified Model of Electronic Government Adoption (UMEGA) were all referenced in one to two papers each. These models cover a broad spectrum of theories ranging from motivation and behaviour determinants to specific technological adoption aspects. This model diversity indicates the robustness of theoretical frameworks to understand e-government acceptance and use in various contexts (Table 6).

Table 4. Environmental context factors

Environmental context factors	
Perceived quality of life	Non-technical (culture/religiosity/social influences)

Source(s): Created by Albar and Hoque, 2017

Table 5. Individual context factors

Individual context factors				
End user awareness\ education\ policy	Trust in technology/ service delivery	Trust in technology/ service delivery	Performance expectancy	Effect expectancy
Psychological risks	Use behaviour/attitude/ optimism bias/ subjective norm	Personal/overall innovation and creativity	User experience	User satisfaction

Source(s): Created by Albar and Hoque, 2017

Theory or model	Research articles (n)
Technology acceptance model (TAM)	15
The diffusion of innovation (DOI)	3
Theory of planned behaviour (TPB)	3
Unified theory of acceptance and use of technology (UTAUT)	13
Social cognitive theory (SCT)	1
The model of personal computer utilisation (MPCU)	1
Self-determination theory (SDT)	1
Uncertainty reduction theory (URT)	1
Information systems [IS] continuance model	1
Quality-value-loyalty chain model	1
Theory of reasoned action (TRA)	1
Unified model of electronic government adoption (UMEGA)	2

Source(s): The author's own creation/work

Table 6. Summary of theoretical models

4.4 Research methodologies used

Various methodologies were employed to investigate the research questions across different studies. Quantitative methods were the most predominant, utilised in 18 papers. Qualitative methods, on the other hand, were used in 4 papers. A smaller subset of the research, represented in 3 papers, employed mixed methods, integrating quantitative and qualitative approaches. The preference for quantitative methods suggests a prevalent emphasis on statistically driven results within the reviewed studies. However, including qualitative and mixed methods indicates recognition of the value of holistic and nuanced understandings (Wasti *et al.*, 2022) (Table 7).

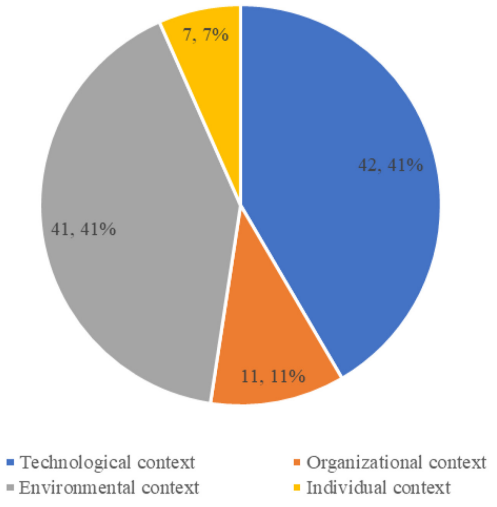
5. Discussion

The analysis of various studies showcases the diverse range of factors that influence the adoption of e-government services. These studies cover an array of geographical locations, including Indonesia, Ireland, and Saudi Arabia. In the reviewed studies, the technological context is less prominent than other contexts. Almamy (2022) identified five of the most direct factors in this context. In contrast, the organisational context highlights several influential factors. Precisely, factors such as service quality, system quality, and information quality have been pinpointed by researchers as crucial determinants of perceived ease of use and usefulness within the realm of e-government services (Cho *et al.*, 2019). On the other hand, the environmental context does not have a broad representation across the studies. Most investigations show a consistent trend of low influence, with the majority registering a peak count of just one factor. Lastly, the individual context has received more expansive exploration. Research by scholars such as Iqbal *et al.* (2020) and Sabani *et al.* (2023) underlines the significance of factors including performance expectancy, effort expectancy, perceived risk, social influence, and facilitating conditions in the e-government adoption process (Figure 2).

Methodology	Research articles (n)
Quantitative methods	18
Qualitative methods	4
Mixed (quantitative methods and qualitative methods)	3

Source(s): The author's own creation/work

Table 7. Summary of methodologies



Source(s): Authors' own creation/work

Figure 2.
Factors Influencing the Adoption of E-government

5.1 Technological context

Several studies' findings elucidate its influence when observing technological context as a direct factor for e-government adoption. Al-Shargabi *et al.* (2020) measured the trustworthiness of e-government Web services through a feedback approach, demonstrating excellent performance when handling different sizes of SoAP messages using triple *DES*. Alkraiji (2020) pointed out that perceived system quality (PSQ) dramatically impacts the ease of use and usefulness of mandatory e-government services. Chatterjee and Kar (2017) asserted that trust in technology and information quality perceptions are significant determinants of trust in e-government. However, system quality was a concern, further confirmed by Cletus and Ayindenaba (2020) and Maditinos and Sidiropoulou (2020).

Other studies, such as Shahzad *et al.* (2020), stressed the significance of perceived compatibility and perceived response time in adopting mobile government (m-govt) security response systems. On the other hand, Munyoka and Maharaj (2019) highlighted the critical role of perceived privacy, security, and trust in utilising e-government systems. Alharbi *et al.* (2014) reaffirmed the importance of security in e-government adoption and emphasised the significance of non-technical issues.

In the array of studies analysed, the technological context, particularly its indirect factors, stands out as a dominant theme of interest. One of the primary focal points across these studies was the quality of the system, service, and information. For instance, Cho *et al.* (2019) emphasised the interplay between these quality factors and how they relate to the perceived ease of use. Interestingly, while service and information quality took centre stage, system quality did not impact perceived usefulness significantly. Another prevalent strand across these studies is the role of trust. Trust's importance, whether in technology, service delivery, or the overarching government, resonates strongly. Capistrano (2020) mainly sheds light on the significance of trust in technology and the perception of information quality as pivotal determinants of e-government trust.

Venturing into security and privacy, its perceived importance emerges as a cornerstone. For instance, Al-Haddad *et al.* (2023) spotlighted the relationship between trust in various sectors, such as service delivery and transactional security, and the credibility of

e-government platforms. This dovetails with other research nuances, emphasising behavioural intentions and their consequential role in e-government adoption. Reinforcing this notion, Alharbi *et al.* (2021) elucidate security's instrumental role in steering e-government adoption. Furthermore, delving into the utility of the system and its perceived value, some studies, like the one by Li and Shang (2019), reveal the intermediary role played by perceived service value, bridging the gap between service quality and the sustained intention of citizens to use e-government services.

5.2 Organisational context

In the myriad of studies reviewed, there is an evident inclination towards understanding the organisational context's influence on adopting e-government services. The research distinctly emphasises the direct factors intrinsic to this organisational context. For example, Cho *et al.* (2019) make a compelling case that while service quality and information quality directly sway perceived usefulness, system quality remains detached. This becomes sharper when considering the mandatory nature of providing personal information for online services, highlighting the inherent emphasis on privacy and security within the organisational fold. Jouaibi *et al.* (2022) exploration into the cyber-security awareness training (CSAT) programs in Ireland's financial landscape suggests that while these programs are present, their effectiveness and uptake by the workforce need to be revised.

Iqbal *et al.* (2020) further pivot the discussion with their findings on the e-report in Gunungkidul Regency, pinpointing a constellation of variables, such as performance expectancy and perceived risk, that leave a notable imprint on the utilisation of the E-Report Application. Studies like Sabani, Sabani, Thai and Hossain dive deep into the Indonesian context, elucidating how system quality and perceived transparency form the backbone of e-government service adoption. This viewpoint gains additional momentum with Sabani's (2020) work, reinforcing transparency's pivotal nature in the adoption matrix.

An intriguing merger of insights from Sabani *et al.* (2023) and Iqbal and Genie (2022) lays bare the profound impact of social influence and performance expectancy on the collective attitude toward e-government adoption. Not to be left behind, Almamy (2022) grounds this understanding within the Saudi Arabian setting, reinforcing the universal weight of the UTAUT model variables on the intention to harness e-government services.

Drilling deeper into the undercurrents of the organisational milieu, some indirect facets emerge prominently. Al-Haddad *et al.* (2023), for instance, contend that although awareness might not reshape attitudes towards behaviour, the pillars of trust – be it in service delivery, transactional security, or the governing body – are instrumental for credibility. Sabani *et al.* (2023) spotlight government encouragement as a subtle but noteworthy driver. This sentiment resonates with findings from Al-Sammarraie and Al-Swidi (2019), which trumpet the paramountcy of citizens being aware of available, e.g. services. Shahzad *et al.* (2020) slot awareness as a principal factor influencing the adoption trajectory of mobile government security response systems (m-govt SRS), while Li and Shang (2019) unfurls a tapestry of dimensions – reliability and responsiveness, to name a few – that sculpt e-government service quality. Conclusively, Hooda *et al.* (2022) encapsulate the discourse by magnifying trust as the linchpin in the complex machinery of e-government system usage intentions.

5.3 Environmental context

When evaluating the environmental context and its direct bearing on e-government adoption, several insights arise from the research curated. Chatterjee and Kar (2017) elucidated the transformative potential that IT-enabled services might infuse into the lives of urban inhabitants in India's envisioned smart cities. Their analysis underscores a palpable

environmental variable influencing e-government adoption. Sabani's 2020 exploration deepened the understanding of the unified theory of acceptance and use of technology, honing in on transparency's role in Indonesia's e-government adoption landscape. This work singles out transparency as a dominant environmental determinant shaping citizen choices. Similarly, Alharbi *et al.* (2014) zeroed in on the weight of security apprehensions, earmarking it as a pivotal environmental component in the e-government adoption matrix. Complementing this, Almamy's (2022) research, while primarily rooted in the UTAUT model's variables, concurrently spotlights the gravity of select environmental factors in Saudi Arabia's trajectory of embracing e-government service.

Turning to the indirect nuances shaping e-government adoption, the distilled studies unfold myriad revelations. Al-Haddad *et al.* (2023) discerned a latent environmental dynamic steering individuals towards e-government utilisation intentions and eventual use. Jouaibi *et al.* (2022) observation bridges this understanding with an underlying environmental linkage to the adoption and efficacy of cyber-security awareness training (CSAT) initiatives within the financial bastions of Ireland. Similarly, Iqbal *et al.* (2020) spotlighted a concealed environmental variable that modulates the report's uptake as a digital service in Gunungkidul Regency. Sabani, Thai and Hossain (2023) deciphered a subtle environmental variable influencing Indonesian citizens' inclination towards e-government service adoption in another corner of Asia. Amplifying this narrative, Al-Sammarraie and Al-Swidi (2019) accentuated a covert environmental dimension entwined with the assimilation of e-government offerings in security-compromised terrains. A synthesis of insights from Sabani (2020) and Iqbal and Genie (2022) further magnifies the latent environmental scaffolding underpinning individual tech assimilation for e-governance. Concluding the arc, Hooda *et al.* (2022) cast a spotlight on the unseen environmental currents, especially when embedding e-government trust within the UTAUT paradigm, as gleaned from their comprehensive meta-review of a substantial pool of preceding e-government studies.

5.4 Individual context

Upon aggregating the insights from the provided studies, several themes become evident. A predominant emphasis is evident across studies on the perceived system quality, with its influence stretching over ease of use and the perceived utility of e-government services. Many research works underline trust in e-government services as a cardinal determinant, influencing users' intent to engage with these platforms. A salient focus emerges on the individual context, with multiple research pieces spotlighting factors such as perceived ease of use, trust, perceived utility, and risk perceptions as primary drivers for adopting e-government services. Interestingly, the environmental and organisational contexts saw relatively sparse exploration, with limited consideration of direct factors. Technologically speaking, many studies honed in on elements like system quality, the calibre of information, and perceived utility.

Delving into the specifics, Capistrano's (2020) study found that trust in technology and perceptions of information quality, alongside concerns tied to system quality, fundamentally steer trust in e-government. Chatterjee and Kar (2017) painted a picture of the transformative potential of IT-enabled amenities in India's envisioned smart urban locales, bringing about socio-technological shifts in residents' lives. Al-Haddad *et al.* (2023) have accentuated the importance of factors such as the perceived ease of navigation, potential incentives, and perceived benefits in shaping attitudes. They also pointed out that the solid pillars of trust in the delivery mechanism, the security of transactions, and government trustworthiness are pivotal for credibility, with social pressures also playing a part in guiding subjective norms (Rouibah *et al.*, 2022). Jouaibi *et al.* (2022) highlighted the interplay of societal influences, experiential elements, and socio-cultural attitudes. They highlighted the significance of both

the TAM and UTAUT frameworks in gauging the success of cyber-security awareness training modules. On the Indonesian front, Sabani *et al.* (2023) showcased myriad determinants ranging from performance and effort expectations to perceived transparency and literacy in ICT in predicting e-government adoption. Other studies, particularly those by Sabani (2020) and Iqbal and Genie (2022), showcased myriad factors like effort and performance expectancy, attitude, and more, guiding the e-government adoption pathway. Shahzad *et al.* (2020) identified numerous aspects, including trust and transparency, as instrumental in determining the uptake of mobile-centric government security solutions. Lastly, Hooda *et al.* (2022) integrated trust into the UTAUT framework and outlined its potency in e-government adoption, emphasising factors like effort and performance expectations.

6. Conceptual framework

Through an exhaustive literature review and an analysis of multiple studies, we identified several key factors that significantly influence the adoption of e-government services. The user's behaviour, attitude, optimism bias, and subjective norms are paramount, guiding users in their interactions with e-government platforms. Research by Chatterjee and Kar (2017) and Al-Haddad *et al.* (2023) supports this, indicating that these elements directly reflect users' perceptions of e-government systems. Research by Capistrano (2020) and Hooda *et al.* (2022) reinforces that trust, particularly in a platform's credibility and reliability, bolsters users' willingness to engage with e-government services.

As Alharbi, Papadaki and Haskell-Dowland (2014) highlighted, security is another critical factor. In the digital age, users prioritise the security of their data, seeing it as pivotal when interacting with online governmental platforms. Intriguingly, non-technical factors also wield significant influence. Sabani (2020) and Iqbal and Genie (2022) illuminate the roles of cultural, religious, and societal factors in e-government adoption, with these non-technical aspects capable of reshaping user perceptions and subsequent behaviours. Moreover, performance and expectancy effect efficacy emerge as major catalysts for adoption. Beyond these pivotal factors, other determinants like system and information quality, perceived risk, user satisfaction, and ease of use shape users' intentions and behaviours towards e-government services. A breakdown of these is provided in Table 8.

Table 8. Factors with the highest effect

Factors with the highest effect (high to low)
Use behaviour/attitude/optimism bias/subjective norm
Trust in e-government (TEG)
Perceived security/security risk
Non-technical (culture/religiosity/social influences)
Performance expectancy – effect expectancy
Perceived system quality (PSQ) – end user awareness\ education\ policy
Perceived information quality (PIQ) – perceived usefulness (PU)
Overall perceived risk – perceived service quality
User satisfaction (US) – perceived privacy/privacy risk – perceived ease of use (PEOU)- trust in technology/ service delivery
Perceived compatibility – perceived transparency – user experience – perceived transparency
Personal information risk – time risk/perceived response time – perceived value (PV) – organisational commitment/encouragement/incentive – credibility and reliability – Availability of resources/accessibility
Accuracy/completeness – personal/overall innovation and creativity – psychological risks – website design – interactivity and responsiveness

Source(s): The author's own creation/work

This study analysis delineated certain factors that directly impact adopting e-government services. Chatterjee and Kar (2017) highlight behaviour, attitude, optimism bias, and subjective norm as leading variables directly shaping a user's likelihood to embrace these services. TEG proves pivotal, with research by Capistrano (2020) emphasising its central role in driving adoption. Jouaibi *et al.* (2022) accentuate the significance of end-user awareness, education, and policy, particularly concerning the efficacy of cybersecurity training. The imperativeness of perceived security and security risk emerges unmistakably as these factors mould users' immediate readiness to use online governmental platforms. The critical direct influencers are performance expectancy and effect expectancy, as they govern the direct inclination of users toward e-government services. These are detailed further in Table 9.

Several factors have an indirect influence on the adoption of e-government services. Notably, Sabani (2020) underscores non-technical aspects, like cultural, religious, and societal influences, that mould user perceptions, subsequently affecting behaviours. While perceived security holds direct sway in many situations, its influence indirectly shapes additional perception-related factors. Quality of information and the system indirectly modulate the value perception users attribute to e-government services, influencing their decisions. Concurrently, perceived service quality stands out, with users evaluating an e-government platform's overall merit based on this determinant, which subsequently shapes their choices. Further bolstering the indirect impact, perceived usefulness, as illuminated by Li and Shang (2019), affects users by sculpting their overarching value perception. These indirect factors are elucidated further in Table 10.

7. Research implications

The comprehensive review and subsequent analyses provide valuable insights for academic researchers, policymakers, e-government platform developers, and other stakeholders. These implications can be segmented into theoretical and practical dimensions.

Factors with the highest direct effect
Use behaviour/attitude/optimism bias/subjective norm
Trust in e-government (TEG)
End user awareness\ education\ policy- perceived security/security risk
Performance expectancy – effect expectancy
Facilitating conditions – user satisfaction (US)
Source(s): The author's own creation/work

Table 9.
Factors with the highest direct effect

Factors with the highest indirect effect
Non-technical (culture/religiosity/social influences)
Perceived security/security risk
Perceived information quality (PIQ) – perceived system quality (PSQ)
Perceived service quality
Perceived usefulness (PU)
Source(s): The author's own creation/work

Table 10.
Factors with the highest indirect effect

7.1 Theoretical implications

This research significantly enhances our comprehension of the diverse drivers influencing e-government adoption. Categorising these drivers based on their impact – whether they have the highest direct or indirect effect – provides a structured framework that can serve as a reference or point of discussion for subsequent scholarly endeavours. Furthermore, integrating findings from various studies has given us a unified understanding of e-government adoption, effectively bridging gaps and harmonising inconsistent points in existing literature. An intriguing aspect of this study's findings is the pronounced emphasis on non-technical factors, such as cultural, religious, and social influences. This draws attention to the potential value of interdisciplinary approaches, weaving together threads from information technology, sociology, anthropology, and behavioural sciences.

7.2 Practical implications

The practical implications of this research have several dimensions that can significantly influence the realm of e-government services. For policymakers, the identified factors provide a roadmap for devising strategies that promise higher adoption rates. This can include bolstering trust-building initiatives, strengthening security measures, and rolling out comprehensive user education programs. Additionally, those involved in e-government platform development can glean from these findings to create truly user-centric platforms, ensuring they resonate with user behaviours, attitudes, and even cultural sensibilities. These insights also pave the way for crafting precise engagement strategies, providing stakeholders ranging from the general populace to tech professionals and government representatives are effectively catered to. Recognising the paramount importance of end-user awareness, there is a compelling case for governments to inaugurate potent training modules, ensuring users not only adopt but derive optimal value from e-government services. Lastly, by discerning which factors are most influential, it becomes easier for governments to channel their resources judiciously, funnelling them into areas that augur the maximum uptick in e-government adoption. This research unravels a comprehensive picture of the dynamics surrounding e-government adoption, presenting a suite of insights that various stakeholders can act upon. The ultimate aspiration is to harness these findings to bolster e-government adoption rates worldwide.

8. Conclusion

In response to the research question, "What are the key factors influencing the adoption of e-government services? And what are their implications?" our study presents a detailed and multifaceted answer. Drawing from a comprehensive review of existing literature and a structured analysis of numerous studies, many factors that play a significant role in influencing the adoption of e-government services have been identified. The key factors influencing e-government adoption span a range of domains, from user behaviour, attitudes, and perceptions to the intrinsic qualities of the platforms themselves. Among these are user behaviour, attitude, optimism bias, and subjective norms. Trust in e-government also emerged as a central determinant, echoing the sentiment that users prioritise the credibility and reliability of the platforms they engage with. As highlighted by many scholars, security perceptions emphasise the essentiality of a robust digital security framework. Furthermore, the importance of non-technical elements – cultural, religious, and social influences – revealed that the digital adoption landscape is deeply intertwined with the socio-cultural fabric of societies. Understanding these factors and their implications is pivotal for harnessing the full potential of e-government services, facilitating efficient governance, and fostering public trust.

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